

**THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE
PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:**

5 1. Non-metallic composite inserts for use in an annular
blowout preventer packing element, comprising: an
flexible non-metallic composite body disposed about a
longitudinal axis, the flexible non-metallic composite
body carrying the non-metallic composite inserts in
: 10 respective radial planes extending from the center of the
preventer and adapted to be compressively displaced
inwardly towards the axis, each of the inserts comprising:

upper and lower flanges;

15

a web element extending between said flanges, said web
element including leading and trailing edges each having
outer arcuate surfaces that are substantially semicircular
for distributing loads applied to a bond line between the
20 inserts and the flexible non-metallic composite body
during the operation of the packing element, and

25

a central rib extending between the edges, the rib being
thinner than the edges, whereby said web element exhibits
a substantially dumbbell-shaped cross section for
efficient reinforcement of the flexible non-metallic
composite body,

30

the shape of the web element increasing the volume of the
flexible non-metallic composite body and eliminating the
use of the metallic inserts in the packing element to
reduce the loads applied to the bond line eliminate sparks
and scoring of string.

2. A packing element for an annular blowout preventer, comprising:

5 a flexible non-metallic composite body disposed about a longitudinal axis and adapted to be compressively displaced inwardly toward the axis;

10 a plurality of non-metallic composite inserts in said body in generally circumferential spaced fashion in respective radial planes extending from the axis for reinforcing said body, each of said inserts comprising:

upper and lower flanges;

15 a web element extending between the flanges, the web element including, leading and trailing edges each having outer arcuate surfaces that are substantially semicircular for distributing the loads applied to a bond line between said insert and said flexible non-metallic composite body
20 during the operation of the packing element, and

25 a central rib extending between the edges, the rib being thinner than the edges, whereby the web element exhibits a substantially dumbbell-shaped cross section for efficient reinforcement of the said flexible non-metallic composite body.

3. A blowout preventer packing element having a flexible non-metallic composite body including a plurality of spaced
30 non-metallic composite inserts embedded in the flexible non-metallic composite body for moving with the flexible non-metallic composite body as the flexible non-metallic composite body is forced toward the center of the preventer to engage a tubular member extending through the

preventer or to close the opening through the annular flexible non-metallic composite body, the improvement comprising:

5 providing each non-metallic composite insert with generally wedge-shaped upper and lower flanges and a connecting web attached to and extending between the flanges, the web comprising:

: 10 a generally flat-sided flange connecting member extending between and connected to the upper and lower flanges and positioned in a radial plane extending from the center of the preventer; and

15 edge portions having a circular cross-section and integrally connected to the edges of the sided flange;

wherein the sided flange is thinner than the edge portions and the web exhibits a substantially dumbbell-shaped
20 cross-section to reduce the volume of flexible non-metallic composite embedded in the flexible non-metallic composite body and the stress imposed on the flexible non-metallic composite body when the flexible non-metallic composite body is forced into position to seal the opening
25 through the preventer.

4. A blowout preventer packing element with non-metallic composite inserts which includes a perforated and corrugated non-metallic composite inserts, each of the
30 perforated and corrugated non-metallic composite inserts, include upper and lower flanges and a corrugated and perforated web element extending between the flanges, the perforated and corrugated web element includes leading and trailing edges, each having outer arcuate surfaces that

are substantially semicircular in cross-section for distributing the loads applied to a bond line between the insert and the flexible non-metallic composite body during the operation of the packing element, a central perforated rib extends between the leading and trailing edges, the

5 perforated rib is thinner than the edges so that the perforated web element exhibits a substantially dumbbell-shaped cross section for efficient reinforcement of the flexible non-metallic composite body.